

NEW PRODUCTS

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LAWRENCE G. RUBIN

FOCUS ON MAGNETISM

High-Temperature SQUID

Tristan Technologies has introduced the new HTM-100 high-temperature superconducting quantum interference device sensor, said to be the first commercially available high-temperature SQUID capable of operating in both ambient and kilogauss environments. It has a $2 \text{ nT}/\Phi_0$ field response with a dynamic range of better than $1 \mu\text{T}$. Using newly developed electronics, the HTM-100's frequency response can extend beyond 100 kHz with white noise $<100 \text{ fT}/\sqrt{\text{Hz}}$. The company's iMAG series of SQUID electronics includes microprocessor-based multichannel control electronics and advanced fiber-optic-lined flux-locked loop circuitry. Tristan also offers a complete line of dewars to allow laboratory, biomagnetic, geophysical and nondestructive evaluation measurements. *Tristan Technologies Inc., 6350 Nancy Ridge Drive, Suite 102, San Diego, California 92121*

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Flux-Gate Vector Magnetometer

MEDA has announced a three-axis handheld flux-gate vector magnetometer, the model FM300. It has a full-scale measurement range of $\pm 100,000 \text{ nT}$ (1 G) with a resolution of 1 nT, $\pm 0.02\%$ of full-scale linearity and a basic accuracy of $\pm 0.25\%$ traceable to NIST. The flux-gate sensor probe can be located up to 30 m from the electronics unit. A two-line, sixteen-character liquid crystal display gives the field values and instrument status. Features include user-selectable measurement units (nanotesla, microtesla or milligauss), user-selectable vector measurement coordinate system (rectangular or polar), absolute or relative display of vector components, $\pm 2.5 \text{ V}$ analog output signals for external data recording and remote operation through an RS232 connection.

Two 9 V batteries power the FM300.

With lithium batteries, the FM300 can operate continuously for up to 12 hours. *MEDA Inc., 485 Spring Park Place, Herndon, Virginia 20170*

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Magnetic Field Transducer

GMW Associates is now offering Sentron magnetic field transducers based on a unique vertical Hall device that is implemented in silicon. The sensor has its magnetically sensitive plane in silicon and perpendicular to the wafer surface and is therefore sensitive to magnetic fields parallel to that surface. To provide a two-axis sensor, two vertical Hall devices can be arranged perpendicular to one another with a common center. In addition, four conventional Hall elements can be placed on the wafer surface around the crossed vertical devices to give a sensitive axis perpendicular to the silicon surface; this three-axis sensor has an accurate angular alignment (better than 0.1°) and a small active volume (less than $0.25 \times 0.25 \times 0.2 \text{ mm}$). The vertical Hall devices provide a magnetic field-to-voltage conversion with better than 100 parts per million absolute accuracy and less than $10 \text{ ppm}/^\circ\text{C}$ temperature coefficient.

An optional Sentron Hall device kit includes two printed circuit boards for operation of two single-axis sensors or one two-axis sensor. *GMW Associates, P.O. Box 2578, Redwood City, California 94064*

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Variable Field Permanent Magnet Flux Source

The permanent magnets in Lake Shore Cryotronics's Multimag series produce stable, homogeneous, fully variable magnetic fields of up to 1.2 T, and unlike electromagnets, can automatically vary both the magnitude and direction of the magnetic field. The magnets are compact, portable, energy efficient and cost effective. At the center of each Multimag is a system of two concentric dipole-ring magnets, controlled independently via a DC motor drive and positioning system. A fully variable field in the magnet bore is achieved by rotating the inner magnet with respect to the outer magnet.

The system controller can configure the field magnitude, direction, sweep rate, direction of sweep, number of set points (in field magnitude or field direction), timing parameters and field units; the magnetic field value is displayed on a $4\frac{1}{2}$ -digit display. *Lake Shore Cryotronics Inc., 575 McCorkle Boulevard, Westerville, Ohio 43082*

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Pulsed Magnet System

Oxford Instruments now has available PulseLab, a pulsed magnet system that includes a charging unit, energy storage, a computer-controlled firing and monitor unit and a liquid nitrogen cooled magnet. Systems are available with energy storage capabilities between 25 kJ and 150 kJ, delivering fields between 30 T and 45 T; all systems can be upgraded. With 150 kJ storage capacity, it can deliver fields in excess of 45 T, yet can be installed in a 3 m^2 room. PulseLab is controlled from a stand-alone personal computer running Windows-based software. It is compatible with the company's Kelvinox series of low-temperature inserts, including a plastic, top-loading dilution refrigerator.

The use of very high field-to-temperature ratios (up to 1200 T/K) is

important in studies of semiconductors, plasma physics, low-dimensional structures, heavy fermion systems, atomic and molecular physics and chemical and organic conductors. *Oxford Instruments, Tubney Woods, Abingdon Oxon OX13 5Q6, UK*

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Pole-Tip Recession Measurement System

Veeco Process Metrology is now shipping the WYKO PTR2100 pole-tip recession measurement system. This noncontact instrument improves process control in thin film head manufacturing by rapidly and accurately analyzing pole-tip recession and protrusion on magnetic head sliders. The WYKO TR2100 is said to be the only gaugeable instrument that repeatably



measures pole-tip recession on nano and pico sliders at production speeds.

The high-throughput WYKO PTR2100 features autofocus, zero-backlash control and vibration sensing for reliable data. It automatically acquires, analyzes and stores individual slider data with positioning. The system's software determines such parameters as pole-tip recession, alumina recession, pole-to-alumina recession and individual pole recession. *Veeco Process Metrology, 2650 East Elvira Road, Tucson, Arizona 85706*

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Shielded High-Field NMR Magnet

The AVANCE 700 spectrometer from Bruker features the 700 UltraShield magnet, a compact, ultra-high-field 700 MHz system for routine nuclear magnetic resonance operation. The 700 UltraShield is said to be the first ultra-

high-field magnet that fits in a standard NMR laboratory, requiring less than 3.6 m ceiling clearance for installation and operation—less space than a traditional 500 MHz magnet. As a result, costly site renovations may often be minimized. The UltraShield provides outstanding field homogeneity, for excellent resolution and line shape. The unit's magnet cryostat has been optimized to allow easy handling for cryogen refills.

Bruker claims that the AVANCE 700 spectrometer results from the company's expertise in ultra-high-field NMR technology that earlier made possible their introduction of the first 750 MHz NMR magnet, followed by the first 800 MHz system. *Bruker Spectrospin Inc, Manning Park, Billerica, Massachusetts 01821*

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Shielding Alloy

Magnetic Shield Cor's NETIC ET shielding alloy is made from NETIC S3-6 shielding alloy with the addition of an electro-tin plating. The NETIC S3-6 alloy provides magnetic shielding for electronic equipment, while the electro-tin coating adds improved conductivity for better electromagnetic interference shielding, superior corrosion resistance and good solderability for ground connections and prototype construction.

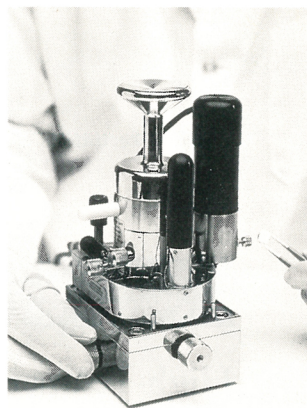
NETIC ET alloy can be used where magnetic shielding is needed and the extremely high permeability of CO-NETIC AA alloy is not required. NETIC ET provides sufficient attenuation in shields for small transformers or small power supplies, barriers between circuit boards to prevent crosstalk, or folded covers for circuit board components. NETIC ET can be readily formed, spot welded and soldered (with a standard electronic solder). Annealing after fabrication is not recommended, due to the tin coating. *Magnetic Shield Corp, 740 North Thomas Drive, Bensenville, Illinois 60106*

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Micro Thermal Analysis

The μ TA 2990 micro thermal analyzer from TA Instruments won the Gold Award as the best new product at the 1998 Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy. This invention combines the capabilities of thermal analysis with atomic force microscopy (AFM). The AFM head is fitted with a miniature temperature probe that provides the heat source and also measures response, yielding information similar to traditional thermal analysis, but on a

microscopic scale. Patented modulated temperature technology is used to enhance the signal and provide depth profiling by varying the frequency over a wide range. This new technology has applications in the study of polymers, pharmaceuticals and food. *TA Instruments, 109 Lukens Drive, New Castle, Delaware 19720*



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Nanovoltmeter

Keithley Instruments announces its new model 2182 nanovoltmeter, with one count in 12 000 000 resolution (1 nV on the 10 mV range). The 2182 uses advanced analog-to-digital technology said to provide sensitive, low-noise measurements many times faster than comparable instruments. The typical peak-to-peak noise is only 30 nV at 1 reading/s; at 15 readings/s (1 power line cycle), the typical noise is 75 nV.

The 2182's "Delta" mode uses the common current reversal method to cancel thermal emfs (electromotive forces) at up to 8 Hz, and can average multiple readings for greater noise reduction; that method requires an external source. To achieve even lower noise levels, a digital filter can be applied to dc voltage readings or after the Delta reading. Other features include a second channel for temperature, ratio or a second voltage measurement, programmable analog output, statistical functions and direct reading of thermocouples for temperature measurement. *Keithley Instruments Inc, 28775 Aurora Road, Cleveland, Ohio 44139*

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New Literature

Lucas Control Systems has published a 100-page catalog featuring the Schaevitz Sensors' linear variable differential transformers (LVDTs), position transmitters, dimensional gage heads, laser sensors and instrumentation. Each product is reviewed in detail, and there is also an eight-page overview of LVDT technology. *Lucas Control Systems, 1000 Lucas Way, Hampton, Virginia 23666*

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